

A STATISTICAL STUDY OF CHARACTER

By JOSEPH KIRK FOLSOM

*Submitted in partial fulfilment of the
requirements for the degree of Doctor of
Philosophy, in the Faculty of Philosophy,
Columbia University.*

Reprinted, slightly enlarged, from PEDAGOGICAL SEMINARY,
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I.

METHOD OF THE INVESTIGATION

The subjects chosen for this research were the entire senior class at a small college, consisting of 76 men. In addition, the investigation covered the junior class there, consisting of 90 men, and a group of 27 psychology students at another college. The data for the two latter groups have not yet been studied, but will be as soon as time allows. They are expected to act as important checks upon the findings here reported, and also to furnish other results of interest.

The data gathered, and the methods of securing them, will be considered under the following heads:

A. Information about each subject not given by himself.

1. *Classmate Judgments* of character. A meeting of 20 volunteer judges from among the 76 seniors was held. Later 8 additional judges were secured to do the same work in private. These 28 men judged their 76 classmates (including themselves) in 12 designated traits of character. The judges were given prepared blank forms, containing a printed list of the 76 seniors, and 12 blank columns, and a typed list and description of the traits to be judged, which appears below. They were instructed to mark every man in the list (except the few who might be unknown to them) one of five possible grades, A, B, C, D, or E, in each trait. They were instructed briefly in the nature of the normal frequency distribution, and told to distribute their grades roughly according to that frequency. It was found that their tendency was to be even more sparing of A's and E's than the normal frequency requires, and to grade conservatively largely in B's, C's and D's. The judges were encouraged to make snap judgments and not to hesitate over doubtful cases. In this way about 1½ hours was the average time used to make the 12×76 or 912 grades. The list of traits follows:

J-1. General AGGRESSIVENESS: tendency to assume command and leadership spontaneously—self-assertion, masterly behavior toward others—boldness of front; as opposed to submissiveness, bashfulness,

¹ See note at close of article.

docility, tendency to follow others, to shrink and retire. This aggressiveness may be either of the pleasing or unpleasing kind: arrogance and conceit may or may not go with it; such should make no difference in judging the quality.

J-2. Love of crowds, large gatherings and society of one's fellows in general; as opposed to tendency to solitude or to very small group of friends—GREGARIOUSNESS.

J-4. KINDNESS: general tendency to show sympathy, pity, tender-heartedness—not necessarily of sentimental and "gushy" kind, however.

J-5. DESIRE FOR ADMIRATION, approval and popularity, as opposed to indifference to the same.

J-9. CHEERFULNESS as opposed to depression, moroseness.

J-10. ENTHUSIASM as opposed to indifference and lukewarmness.

J-13. PERSEVERANCE as opposed to tendency to quit or change.

J-15. Handsomeness of PERSONAL APPEARANCE, as given by nature.

J-16. PERSONAL APPEARANCE, meaning neatness of dress, etc.

J-18. Degree of BODILY ACTIVITY, as opposed to laziness.

J-19. Degree of MENTAL ACTIVITY, in studies and outside interests together, as opposed to mental laziness.

J-X. General Intelligence.

2. *Professors' Judgments.* Blanks and lists of 7 traits were given to those members of the faculty who had a fair acquaintance with the upper classmen, with instructions to judge all the men they knew, by the same method as used by the student judges. In all, 30 faculty men made these judgments. No instructor judged more than about half the class, and many could judge only 2 or 3 men. Each student in each trait received anywhere from zero to 9 judgments, the average number being about 5. In the 5 traits which were finally used, practically all the 76 subjects scored at least 2 judgments.

The list of traits follows:

Pr-1. GENERAL INTELLIGENCE. Total intellectual ability of the man as well as you can judge it. Not to be confused with interest, effort, nor mere rote memory. High marks in studies may or may not be a close index of this. Other things being equal, of course they will.

Pr-2. GENERAL AGGRESSIVENESS. Same as J-1.

Pr-4. Degree of INTEREST IN INTELLECTUAL THINGS of any kind, whether in studies or side lines, as opposed to indifference to the same; not ability but *interest* and *curiosity* is meant.

Pr-6. SELF CONFIDENCE as opposed to lack of confidence.

Pr-7. PERSEVERANCE as opposed to tendency to quit or change.

3. *Objective Performance Records.* It has been impossible to secure the scholarship grades of the men kept by the college. To make intelligence tests upon the 76 men was not practicable. Two objectively determined variables were, however,

measured: (1) social popularity or leadership; (2) athletic achievement and activity. (1) was measured by scoring points, according to importance, for each position or office held by election (in a few cases appointment) by one's fellow students. The aim was to measure achievement as determined by popularity and as far as possible to eliminate the factors of specific abilities, scholastic or athletic. Of course this measurement was somewhat arbitrary, but was the best securable in a reasonable time. The records were taken from write-ups for the college year book, plus some assistance from question 15 of the questionnaire. The result of this measurement was an exceedingly skewed distribution, 12 men all getting zero points, many getting 3 and 4, whereas the best 25 per cent of the men made scores ranging from 11 up to 38 points. To make this variable easier to handle, the men were ranked from 1 to 76 and rearranged in a frequency distribution of 15 class intervals, with frequencies 1, 2, 3, 4, 6, 8, 9, 10, 9, 8, 6, 4, 3, 2, 1; whose mean is 0, standard deviation 3 intervals, and total range $2\frac{1}{2} \times$ the standard deviation on each side of the mean.

(2) Athletic score was obtained from the same write-ups; plus additional information given in the questionnaire. It was likewise determined by transmuting the point-measurement to a rank order and then to an arbitrary frequency distribution. The score gives credit primarily to athletic *ability*, but also to effort to make teams; it gives no credit to athletic activities outside of the regular organizations nor to mere liking for physical activity.

4. *Physical data.* The physical examinations and strength tests given to the men at their entrance to college, 3 years previously, were secured for 70 out of the 76 men.

B. Information given by the men themselves.

5. *Advertisement Tests.* Each man in the class was asked to perform an experiment essentially like that reported by Dr. Hollingworth in "Judgments of Persuasiveness" (29). The test was given in 2 sets of 24 slips each, the sets to be kept entirely separate and independent. Each slip contains copy advertising some abstract commodity, with a heading which emphasizes or sums up the point of the appeal. The 24 advertisements of series A correspond respectively to the 24 of series B; two corresponding advertisements are supposed to appeal to the same general motive—but are worded differently, both as to heading and body. The subject is asked to arrange the 24 advertisements in order of their per-

suasiveness or strength of appeal to him; then to do the same for series B independently. The slips and direction sheets were given out to the men in one of their classes, and the experiment performed by each man in his own time. With about half the men or more, an interval of over a week occurred between arranging the two series. The advertisement slips are given below:¹

1. LEADERSHIP. 1E3.—There are plenty of mediocre men, but there is always a need for leadership. 1E3 will insure your rapid rise to a position of importance and authority in your business. Why not start climbing today?

2. AMBITION. 2E1.—There's always room higher up. Capable leaders are always in demand. Why stay among the incompetent when 2E1 will bring you a better position and increase your salary? 2E1 will guarantee your recognition and rapid promotion.

3. POWER. 1X8.—Leaders of men throughout the world make use of our 1X8 system. It will help you get that sense of confident mastery and power which is absolutely essential to him who would hold a position of command.

4. MASTERY. 2X5.—When big problems arise and crises threaten, the master of the situation is he who can exert the most genuine influence and power over other men. Our 2X5 method will help you fit yourself to be a commander in the world of affairs.

5. DIGNITY. 1P3.—Many an otherwise able man has failed because of the lack of that dignity which is necessary to influence other men. Our 1P3 is noted for the dignified appearance and air of prestige which it gives its users.

6. DISTINCTION. 2P1.—Personality is what counts nowadays. One of the chief elements of a powerful personality is a dignified presence. 2P1 lends prestige and distinction to its users.

7. SELF-RELIANCE. 1U4.—The man who uses 1U4 need not wait upon his associates nor rely upon the whims of other people. The most helpful of all U's is the one which helps a man to help himself.

8. INDEPENDENCE. 2V1.—No self-reliant man likes to bother his friends or depend upon his neighbors for—. The man who possesses 2V1 can stand upon his own feet and face the world with confidence. 2V1 makes for independence.

9. POPULAR. 1G7.—The name is on all tongues. You will find 1G7 in the ladies' dressing room, in the scholar's study, in the nursery, in the kitchens of the humble, in crowded eastern cities and on limitless western plains. Used in millions of homes.

10. APPROVED BY THOUSANDS. 2G7.—From coast to coast traveling men hear the praises of 2G7. Why hesitate to try it when thousands of others are using it daily with genuine satisfaction? Popular approval is the best recommendation.

11. STYLISH. 1H8.—Our new 1H8 is fresh from the center of fashion, representing the latest creation of accepted artists of style, in exclusive pattern and dressy designs.

12. NOBBY. 2H5.—Made by our smartest designers, 2H5 products

¹ I am indebted to Dr. Hollingworth for permission to use some of his material.

are especially intended for those who love nobby and dressy models. Exclusive patterns and dashing styles, unequalled in snap and color.

13. CIVIC PRIDE. 1Y4.—Our 1Y4 is made in your own city, by local workmanship, and it is backed by strictly home capital. Stand up for your community and encourage home industry. Ask for 1Y4.

14. PATRIOTISM. 2Y5.—When you buy 2Y5 you get a product that is made for American consumers, of strictly American grown materials, by an American firm, employing exclusively American labor and American capital.

15. UP TO DATE. 1J6.—Are you a back number? Then why hesitate to try 1J6, which is recognized as the most up-to-date J— on the market. It will help your establishment to meet the approval of all thoroughly modern business men.

16. PROGRESS. 2J9.—Don't be a dead one. 2J9 is an essential part of every progressive and thoroughly modern establishment. Let us help bring your plant up-to-date by showing you 2J9.

17. CONSERVATIVE. 1B2.—1B2 is the only conservative and widely used article of its class on the market. Its value is demonstrated by many years of successful use. Don't invite the ridicule of sensible people by experimenting with new and untried makes.

18. NORMALITY. 2B3.—The value of 2B3 is proved by years of experience. The man who tries to be radical and independent in buying B's is simply eccentric. If you would hold the respect of the rank and file of normal people, trust their judgment and buy 2B3.

19. RARE VALUE. 1Z5.—Your new 1Z5 may cost a little more than the ordinary brand but it possesses absolutely superior quality and finer finish. One trial will convince you that it's worth the slight difference in cost.

20. QUALITY. 2Z7.—Why keep on wasting money when for the price of the older type of article you can get your own superior 2Z7. Goes just as far and lasts just as long but does more sensitive work and yields a finer product.

21. DURABILITY. 1W5.—Combine equal utility with durability by using 1W5. It lasts one-third longer than the ordinary article, combining equal quality with greater permanence and longer service. Stands the wear and tear of constant use.

22. STANDS THE STRAIN. 2W8.—Our chief argument for 2W8 is on the score of its ever-lastingness. It does the same work as other brands with equal ease and it costs the same as others of its type. But experience shows that it will stand harder use and longer service.

23. EXPEDITIOUS. 1T8.—Save the minutes and the hours will save themselves. Time is money and our latest 1T8 is the biggest time saver on the market. Does in 20 minutes what requires, with other brands, a half an hour.

24. TIME SAVED. 2T5.—Elimination of useless movements is the equivalent of many days added to a man's life. The ordinary — requires 17 distinct manipulations. 2T5 reduced this to 12 processes and reduces the time from 15 to 20 per cent.

25. EFFICIENCY. 1D9.—Actual earning power is what counts in modern business. Recognition no longer rests on pull and social influence. 1D9 will increase your efficiency 25 per cent. By no other means can you secure such prompt and sure increase of earning capacity.

26. GETS RESULTS. 2D8.—Actual results are what count in the

modern world. Good intentions and reputation are no longer the keys to success. 2D8 will increase the efficiency of your day's work and your consequent earning power by 25 per cent.

27. STANDARD. 1O6.—Our 1O6 article is manufactured by approved scientific methods and by scientifically tested processes and by technically trained men, working under the constant supervision of experts.

28. SCIENTIFIC. 2O3.—Our latest 2O3 is the result of generations of experience and of scores of experiments. After years of trial 2O3 stands distinctly in a class by itself as the final product of a long evolution—a triumph of mechanical genius.

29. INGENUITY. 1M1.—1M1 is equipped with every advantage and ingenious device known to modern invention. It embodies the latest improvements in pattern and is a model of skillful contrivance. Let your head save your heels.

30. INVENTIVE GENIUS. 2M4.—2M4 is not a makeshift but a real invention. It takes advantage of every known device to save time and trouble by the use of intelligence. It embodies also a new contrivance just invented for its special purposes.

31. MECHANICAL ACCURACY. 1V6.—No. V—, however well built, gives satisfaction unless it can be controlled quickly and accurately by the operator. 1V6 does not run by guesswork but its mechanism is so nicely adjusted that it responds to your slightest touch.

32. CONTROL. 2V7.—Our 2V7 device will enable you to operate your — with ease and precision. Why continue the old clumsy and unsatisfactory methods of adjustment when 2V7 will give you perfect control of every part of the mechanism.

33. HYGIENIC. 1O3.—As a general tonic 1O3 is unequalled. It nourishes the system, enriches the blood, builds up firm healthy tissue and gives tone and color to the whole body.

34. HEALTH. 2O8.—The bad effects of shock and worry can be combated only by building up strong native resistance. 2O8 when appropriately used, invigorates the system, giving it vigor, firmness, and heightened tone and resistance.

35. TEMPTING. 1N7.—Try 1N7. It comes fresh from the field and its appetizing flavor is a treat to the palate. It makes a dainty breakfast, a delightful luncheon and a delicious dessert.

36.—APPETIZING. 2N4.—Ripe solid—with the dew standing on them. When you open them the juice glistens temptingly and the delicious flavor is unexcelled. The 2N4 process retains all their native quality and freshness and all their delicate aroma.

37. PURITY. 1F3.—This is the only sanitary 1F3 on the market. Put up in germ-proof, dust-proof, hermetically sealed packages and made of strictly pure and unadulterated ingredients.

38. CLEANLINESS. 2F7.—No human hand touches 2F7 until you take it from the package. It is prepared by thoroughly hygienic processes, in well ventilated and dustless premises, with the most painstaking sanitary precautions.

39. ECONOMICAL. 1S3.—A dollar saved is a dollar earned. 1S3 will help you save your money. Why not cut down expenses items and start a bank account. 1S3 will help you do it.

40. BARGAIN. 2S9.—No 2S9 was ever offered before for half the money. We are enabled to offer this proposition only by virtue of our mammoth plant and our enormous producing capacity. As good as others and only two-thirds their cost. Why pay more?

41. SELF-DEFENSE. 1A6.—Your life is always threatened by some lurking danger. 1A6 in your home secures you and enables you to protect the rights and person of yourself and of those whose safety is your chief concern. Forearmed is forewarned.

42. SAFETY. 2AS.—Avoid danger by using the only absolutely safety-built, accident-proof 2AS. Don't court danger by taking chances. This is the only 2AS in which you get all the protection and none of the risk.

43. SYMPATHY. 1Q6.—Kindness is the first law of humanity. Much of the pain and discomfort inflicted on dumb animals can be relieved by the general use of 1Q6. Be human to your beast. Use 1Q6.

44. PHILANTHROPY. 2Q5.—Our 2Q5 is manufactured for our trade by the inmates of the Mendow⁹Institution for Crippled Children. This article is one of the very few things that these little invalids are able to produce and every 2Q5 sold adds to their comfort and welfare.

45. AFFECTION. 1H3.—1H3 makes a suitable gift for parent brother, sister or friend. Those whom you profess to love are helped by being reminded occasionally of your feeling in some concrete manner. No better token of affection and kindness can be found than a gift of 1H3.

46. FRIENDSHIP. 2H7.—Show your gratitude and regard toward your friend by making him or her a present of 2H7. Not words but acts of thoughtfulness and kindness are what count in cementing real friendship.

47. WEIRD. 1L2.—If you want to read something strange, weird, and fascinating, get a copy of our "Travels in —". It describes real situations and experiences so unusual that nothing like them is known even in fiction.

48. INTENSELY INTERESTING. 2L4.—Our new — will explain briefly the five most marvelous discoveries of modern times. The secrets and mysteries of Oriental magic are unraveled by the most unexpected findings of science. The pages will prove a continuous source of wonder and interest.

6 and 7. *Questionnaire Data.* A month after the advertisement tests, a questionnaire was given to each man. These ask questions of two general kinds. (6) to secure information about personal history which might be of significance in determining character. (7) to secure data of present interests and ideals, likes and dislikes (i. e.—stimuli). 73 out of 76 men finally gave adequate responses to the advertisements and questionnaires. The questionnaire is reproduced below:

Name..... Class.....

1: List all your brothers and sisters, including also any other children, *who grew up in the home* with you, if any; giving the age of each with respect to your own. (Names, etc., not wanted). Thus: Brother, six years older; sister, two years younger, etc. Exclude any who died before age 2.

2: Where did you live most of the time from age three up to age fifteen? Farm, town or village under 8,000, city 8,000 to 100,000 population, or city over 100,000

3: Which do you prefer to live in now? Country.....,
City

4: Tell the nature and extent of all (a) employment, (b) home duties, you have had before entering college: Kind of work....., between what ages..... Average hours per day.....

(a)

(b)

5: What employment have you had in college?

6: What per cent. of your play time, on a rough guess, did you spend

(a) in gangs or large groups

(b) with chums or groups of 4 or less

(c) alone

Indicate in both cases whether this was from preference or necessity.

7: Did you, up to the time of your entrance into college, take an interest in constructing or building things, or engage (for pleasure, not necessity) in mechanical or constructive activities of any kind?..... If so, give list of things constructed and activities engaged in that you can remember.

8: What is your intended vocation? If not decided yet, what is the difficulty, and what possible lines of work are you considering? Please mention briefly, *in order of their importance*, the chief motives of your choice..... If your choice is not your real preference, what would you most like to do?

9: Go through the following list of activities and give everyone a mark as follows:

Your extreme favorites, + + + Those you like very well, + + Those you rather enjoy, but are not very keen about, + Those you dislike, take no pleasure in,—

Notes: Consider yourself a participant, except where otherwise specified. No feminine companion assumed except in dance. Consider your enjoyment of the activity for its own sake, without regard to whether it is compulsory or not.

Mark:

Baseball
Football
Basketball
Tennis
Swimming
Rowing
Canoeing
Bicycling
Track and running games
Jumping and vaulting
Gymnasium work (apparatus)
Skating
Boxing
Wrestling
Fencing
Handball
Bowling
Rifle-shooting
Tramping in woods and fields
Mountain climbing
Camping

Mark:

Agricultural activity—garden-
ing, etc.
Collecting any natural objects
Caring for and watching Ani-
mals
Photography
Building or making something
Experimenting with mechanical
or electrical apparatus
Experimenting in chemistry or
biology
Public speaking or debate
Writing, composing, journalism
Taking part in amateur drama-
tics or entertainment
Attending club, fraternity class
meeting, smoker, etc.
Running or directing social and
business affairs, meetings, etc.
Social dance

Mark:

Hunting
 Fishing
 Travelling
 Pool or billiards
 Card games
 Reading, good fiction
 Reading anything else. What?
 Chess, checkers, etc.
 Musical practice
 Artistic work—drawing, design-
 ing, decorating, etc.

Mark:

Watching—
 A good play
 Good moving pictures
 Good opera
 Varsity game of the kind you
 like best to watch
 Business contact and interviews
 with men
 Meeting strangers
 Anything else

10. (a) Number the following nine groups of studies in the order of *your* interest in them. (Use pencil—erase and change till you get the order to suit you). Be sure to number all of the nine. Consider each subject in its broadest sense—as including all its special branches and applications: (b) Mark all those which you actually like and mark those which you dislike, thus indicating where the zero point comes in your scale of interest. (If you have not studied some of these in college, judge from outside reading and general acquaintance.) Be careful to give every one of the nine a mark for both (a) and (b).

(a) Rank (b) or —
 Number

- A. Mathematics
- B. Foreign languages
- C. English literature
- D. History
- E. Physics, mechanical and electrical sciences
- F. Chemical sciences
- G. Biological sciences
- H. Psychological sciences (including ethics, religion, pedagogy, philosophy, etc.)
- I. Economics, political social sciences

II.

THE VARIABLES AND THEIR CORRELATIONS

Treatment of data, results, and discussions.

The data of the investigation can best be conceived, as noted previously, as so many *variables* of behavior traits, interest, physique, etc., each in practice appearing as a column of numerical values running parallel with the column of 76 names of individuals in the group. Some variables are directly determined from the original data, while others are various composites (usually by addition or subtraction or corresponding values) of two or more other variables. In the case of a great many of the variables, from 2 to 6 of the individuals out of the 76 lacked records (in the physical records 6 are missing). In most cases, the procedure employed was to assign arbitrarily the missing values. These values assigned were the integer nearest the group average in that variable, except in a very few cases where there was good reason for an

estimate of a value farther from the mean. The tendency of such arbitrary assignments is of course to lower slightly any correlations that exist.

1. *Classmates' judgments.*
2. *Professors' judgments.*
3. *Objective records.*

The lists of traits to be judged, given above, were selected from the following provisional viewpoint:

(1) Traits aggressiveness, gregariousness, kindness, desire for admiration, mental activity, manipulative, intellectual interest, refer to the strength of certain instinctive tendencies, considered as units of behavior. Self-confidence is considered as an aspect of the aggressive or self-assertive tendency.

(2) Perseverance, cheerfulness and enthusiasm are considered as more basal, temperamental characteristics common to many or all instinctive behavior tendencies.

(3) The others are variables of appearance, activity, and finally, intelligence, whose relations to the other traits were thought worth investigating.

It is to be noted that the traits are purposely described as far as possible in terms of behavior: they are meant to be thought of as *characteristics of behavior* rather than as "qualities" of "character" or "mind."

The judges were kept in two halves of 14 judges each. In the second half were put the 8 judges who had worked by themselves and two who spent only a part of the time at the meeting, and a random four others. The first half consisted of 14 judges, all of whom did their work entirely at the meeting and thus received more oral coaching and explanations. Of course the others were given full instructions also, but had no chance to ask further questions. Now the grades given to each individual were averaged. In doing this, the grades A, B, C, D, E, were translated into numerical values 5, 4, 3, 2, 1, respectively, and the final result multiplied by 100. Thus the scores obtained by averaging these grades would have in each case a possible range of from 500 (for a subject getting all A's) to 100 (if he got all E's), with a mean of about 300. The average was taken for the two halves of 14 judgments each, and then for the whole 28. This latter of course gives the complete final score of each subject in each trait. When any trait-variable is mentioned hereafter, it will refer to this final average score of all the judgments for each subject in that trait.

Naturally there were many omissions made by the judges, and the actual number of judgments to be averaged was not

always 28, but often a few less. For only 11 of the 76 subjects, however, was this number less than 26, and the lowest was 18.

The purpose of keeping the judgments in two groups was to determine the reliability of the total score by finding how closely its two halves agreed with each other. In other words, it was found how closely the first 14 judges as a group agreed with the other 14. This was measured by computing the correlation between the two partial scores called the reliability correlation.

The method of correlation was as follows:

The Pearson coefficient is used in all cases, but its computation is abbreviated by grouping all values into class intervals of 25 points each. In all cases 300 is taken as arbitrary origin—as center of the middle interval; 325 is then center of the $+1$ interval; 350 of $+2$; 275 of -1 , etc. The extreme classes are 8 and -8 , thus making a total of 17 classes. Some traits, however, cover a range of only 9 intervals; most of them about 12 or 13. Every value is assigned to the nearest class center. Thus 312 is in the 0 class and 313 is called $+1$. This coarse grouping method attenuates the correlations, but has been used in all cases with the judgments for the sake of time. In studies of this kind, the data dealt with are so imperfect that great accuracy of the correlation coefficient is not worth the sacrifice of time necessary to secure it, at least when the primary purpose of the research is psychological and explorative rather than statistical and finely determinative. Furthermore, the correction for attenuation covers this error also. This method of grouping and correlating is taken from Yule, (75, 1912 edition, p. 181 ff.)

NOTE.—In correlating the traits with other data, as described later, as a rule a much finer grouping was followed in computing the coefficients.

All correlations were computed by first distributing the pairs of values graphically. By adopting certain standard practice, cross section paper, etc., it was possible after the means and standard deviations for each trait were obtained, to do all the remaining work of computing the 66 inter-correlations of 12 traits in about 16 minutes for each correlation. The great advantages of this graphic method are (a) that one can tell by inspection the general nature of the relation of the 2 variables—as to whether it is linear or no, etc., and (b) instead of having to compute each of 76 product sums individually, they are classified and assembled in such a way as to save much time. The reliability correlations of the traits were computed in the same way. The computing of means and

standard deviations was in all cases by the coarse-grouping method used in computing the correlations.

It is evident that the traits on which the judges best agree, as shown by high reliability correlations, are also those which are given the greatest range of distribution, as shown by the standard deviations; and we infer that these traits are easier to judge and hence the judges are less bashful about giving the extreme high and low grades. The highest agreement is on such directly observable traits as appearance, and the poorest, on such traits as kindness and cheerfulness, less obvious to the observer.

In computing the reliability correlations for the professors' judgments the first half (including the odd judgment if the number was odd) of all the judgments for each subject in each trait, was averaged, and then the remaining judgments were averaged separately. Despite the great irregularity of the data, the reliabilities are fairly high, but of course not as high as with the student judgments where the number of judges for each man averaged about 26 instead of 5.

The objective record scores were not put into random halves to get their reliabilities.

TABLE 1
CHARACTER TRAITS: CONSTANTS AND RELIABILITY CORRELATIONS

	Mean	Standard deviation	Reliability correlation
J 1. Aggressiveness.....	293.1	70.0	+ .913
J 2. Gregariousness.....	308.2	63.0	+ .908
J 4. Kindness.....	308.2	39.5	+ .706
J 5. Desire for admiration.....	308.5	62.5	+ .856
J 9. Cheerfulness.....	308.9	52.7	+ .741
J 10. Enthusiasm.....	299.0	62.0	+ .886
J 13. Perseverance.....	315.5	46.7	+ .798
J 15. Handsomeness.....	296.7	71.2	+ .922
J 16. Pers. appearance—artificial	320.1	68.2	+ .930
J 18. Bodily activity.....	293.8	54.5	+ .760
J 19. Mental activity.....	312.5	53.8	+ .825
J X. General intelligence.....	314.1	45.0	+ .794
Professor's Judgments			
Pr 1. General intelligence.....	338.5	80.0	+ .59
Pr 2. Aggressiveness.....	324.0	68.8	+ .47
Pr 4. Intellectual interest.....	334.6	65.2	+ .42
Pr 6. Self confidence.....	342.7	66.3	+ .60
Pr 7. Perseverance.....	345.0	77.5	+ .61
Objective Records (In class intervals)			
Pop.= Popularity.....	0	3.07	
Ath.= Athletic achievement.....	0	3.27	

1 class interval = 25 p. or original units

Table 1-A gives the same data for a group of 28 students at another college, who were judged by 27 judges (themselves) in 14 traits. The list of traits used was somewhat different. Here, the average number of judges rating each individual was about 18, instead of about 26 as in the larger group. It will be observed, that, as with the other group, the traits aggressiveness, gregariousness and handsomeness show high reliabilities, while kindliness is much lower. It is significant that the trait "Depth and strength of EMOTIONS in general as opposed to coldness" was judged with no agreement whatever. This would seem to be evidence against considering emotions in general as a significant variable; but it may be merely that it cannot be measured in this way.

TABLE 1-A
GROUP OF 28 MEN. CONSTANTS FOR TRAITS

Trait	Mean	Standard deviation	Reliability correlation
1. Aggressiveness.	307.2	53.1	.87
2. Gregariousness.	309.4	51.7	.81
3. Kindliness.	329.3	32.6	.39
4. Desire for admiration.	322.4	38.6	.60
5. Curiosity—interest.	333.2	41.2	.63
6. Tendency to be disgusted ...	310.3	41.3	.58
7. Readiness to anger.	290.7	35.6	.60
8. Tendency to fear—timidity..	292.4	41.7	.66
9. Bodily activity.	302.9	51.0	.93
10. Strength of emotions in general	313.4	21.8	— .03
11. Cheerfulness.	312.7	39.3	.59
12. Perseverance.	326.9	39.1	.56
13. Natural handsomeness.	290.9	56.5	.87
14. Strength of sex instinct.	314.5	39.0	.69

Table 2 gives the intercorrelations of all the traits, including those judged by the professors and the two objectively determined variables popularity and athletics. Table 2-A gives these coefficients corrected for attenuation due to unreliability in the estimate-averages. The correction formula used was

$$r_{xy} \text{ corrected} = r_{xy} \text{ obtained} \sqrt{\frac{1 + r_{x1\ x2}}{2 r_{x1\ x2}} \frac{1 + r_{y1\ y2}}{2 r_{y1\ y2}}}$$

where r_{xy} is the correlation between two traits, and $r_{x1\ x2}$ is the correlation between the two partial measurements of the trait x and $r_{y1\ y2}$, the same for y . (70, p. 80; and 53.) Where simply 'aggressiveness,' 'general intelligence,' or 'perseverance' are mentioned, they will refer to the students estimates unless otherwise specified.

TABLE 2
RAW COEFFICIENTS. CHARACTER TRAITS—INTERCORRELATIONS

	J1	J2	J4	J5	J9	J10	J13	J15	J16	J18	J19	JX	Pr1	Pr2	Pr4	Pr6	Pr7	Pop.
Classmates' Estimates																		
J1. Aggressiveness.....	+.82	+.32	+.08	+.65	+.82	+.37	+.02	+.89	+.49	+.31	+.46	+.79						
J2. Gregariousness.....	+.23	+.79	+.57	+.81	+.11	+.44	-.03	+.50	+.12	+.37	+.37							
J4. Kindness.....	+.84	+.83	+.44	+.20	+.47	+.41	+.81	+.35	+.07	+.88	+.74							
J5. Desire for admr., etc.	+.73	+.80	+.12	+.57	+.45	+.41	+.42	+.88	+.32	+.74	+.32							
J9. Cheerfulness.....	+.89	0	+.34	+.34	+.59	+.71	+.81	+.35	+.50	+.12	+.37							
J10. Enthusiasm.....	+.41	+.64	+.26	+.59	+.45	+.41	+.81	+.35	+.50	+.12	+.37							
J13. Perseverance.....	+.55	+.64	+.34	+.57	+.47	+.44	-.03	+.89	+.49	+.31	+.46							
J15. Handsomeness.....	+.49	+.64	+.26	+.59	+.45	+.41	+.81	+.35	+.50	+.12	+.37							
J16. Per. appear., artificial	+.84	+.65	+.37	+.69	+.71	+.42	+.88	+.32	+.74	+.32	+.74							
J18. Bodily activity.....	+.42	+.09	+.13	+.28	+.20	+.42	+.88	+.32	+.74	+.32	+.74							
J19. Mental activity.....	+.42	+.09	+.13	+.28	+.20	+.42	+.88	+.32	+.74	+.32	+.74							
JX. General intelligence	+.63	+.34	+.17	+.46	+.39	+.55	+.74	+.32	+.74	+.32	+.74							
Professors' Estimates																		
Pr1. General intelligence	+.24	+.59	+.07	+.70	+.54	+.69	+.72	+.31	+.45	+.55	+.48	+.67	+.52	+.35				
Pr2. Aggressiveness.....	+.75	+.75	.....	.....	.....	.....	+.67	+.16	.....	+.72	.....	+.58	+.70	+.76				
Pr4. Intellectual interest	+.52	.....	.....	.....	.....	.....	+.52	+.19	.....	.....	.....	.....	+.55	+.20				
Pr7. Perseverance.....	+.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....				
Objective Records																		
Pop. = Popularity.....	+.72	+.65	+.32	+.56	+.51	+.52	+.17	+.68	+.59	+.70	+.09	+.36	-.03	+.33	-.09	+.17	.....	.....
Ath. = Athletics.....	+.51	.....	.....	.....	.....	.....	.....	.....	.....	+.68	.....	+.15	+.06	.....	.....	.....	.....	+.65...

TABLE 2-A

CORRECTED COEFFICIENTS

	J1	J2	J4	J5	J9	J10	J13	J15	J16	J18	J19	JX	Pr1	Pr2	Pr4	Pr6	Pr7	Pop.
J1..	+.86																	
J2..	+.26	+.36																
J4..	+.84	+.84	+.09															
J5..	+.89	+.92	+.73															
J9..	+.81	+.84	+.50	+.22														
J10..	+.93	+.84	+.14	+.60	+.92													
J13..	+.45	0	+.38	+.62	+.13	+.40												
J15..	+.57	+.67	+.29	+.77	+.52	+.43	-.02											
J16..	+.51	+.72	+.44	+.62	+.50	+.43	-.03	+.93										
J18..	+.93	+.72	+.15	+.31	+.83	+.90	+.41	+.55	+.54									
J19..	+.45	+.10	+.20	+.15	+.23	+.45	+.98	+.35	+.13	+.35								
JX..	+.69	+.37	+.20	+.51	+.45	+.60	+.83	+.35	+.40	+.52	+.88							
Pr1..	+.29	+.76	+.10	+.92	+.73	+.89	+.89	+.60	+.40	+.74	+.63	+.83	+.76	+.57				
Pr2..	+.97	+.13	+.00	+.00	+.00	+.00	+.93	+.21	+.00	+.00	+.99	+.77	+.105	+.10				
Pr4..	+.61	+.00	+.00	+.00	+.00	+.00	+.63	-.22	+.00	+.00	+.00	+.00	+.73	+.29	+.79			
Pr6..	+.04	+.00	+.00	+.00	+.00	+.00	+.00	+.00	+.00	+.00	+.00	+.00	+.00	+.00	+.95			
Pr7..																		
Pop..	+.73	+.66	+.35	+.58	+.56	+.53	+.18	+.69	+.60	+.76	+.09		-.03	+.41	-.12	+.20	+.00	+.65
Auth..	+.52	+.00	+.00	+.00	+.00	+.00	+.00	+.45	+.00	+.73	+.00		+.07	+.00	+.00	+.00	+.00	+.00

TABLE OF PROBABLE ERRORS of all correlation coefficients where $n=76$, which is always the value of n except when otherwise specified.

It is unnecessary to compute the probable error for each coefficient given, this being little more than a conventional formality. By referring to the following table of generic values of the P. E. for each .10 in the value of r , the P. E. of any coefficient can be quickly interpolated with sufficient accuracy for any purpose covered by this investigation.

$n=76$	
$r=$	p. e.=
1.00	0
.90	±.015
.80	.028
.70	.039
.60	.050
.50	.058
.40	.065
.30	.070
.20	.074
.10	.076
0	.077

Discussion of the intercorrelations. This table has not been treated by Spearman's method of computing the correlations of the correlations to search for general factors. Inspection shows, however, that for many pairs of traits such as J1 and J10, this value would be very nearly unity and thus satisfy Spearman's criterion.

Practically all the correlations are positive and many nearly unity. The traits most opposed to each other have a neutral and not a negative correlation. The trait whose average correlation with the other 11 student-judged traits is highest is aggressiveness. This also has the second highest correlation with the objective popularity record or elective leadership. Popularity goes best with bodily activity (+.76) and third best with handsomeness (+.69). Very clearly, the tendency to take part in and succeed in athletics, to be elected and appointed to offices and societies by one's fellows, and the tendency to be judged handsome, aggressive, sociable, cheerful, enthusiastic, and bodily active by them, are all highly related to each other, so highly, in fact, that we suspect that the success in college social life has biased the estimations of all the traits. We do not know how far this "character" is the cause and how far the result of the student's social attainments.

However, the inspection of Pr2, the professors' estimate of aggressiveness, shows that this highly agrees with the classmates' estimate. The professors are not ignorant of the college activities of their students, however, and are hence open to the same bias, but not to such an extent. It is significant

that Pr2 correlates considerably less with popularity and with handsomeness than does J1, and correlates more with the professors' estimate of general intelligence.

Inspection shows that the two opposite poles of the system, so to speak,—the most opposite groups of traits that can be found—are the aggressive social traits on the one hand and the intellectual traits on the other. The correlations of mental activity and perseverance as estimated by classmates show that they are very much the same thing. The instructors' estimate of intellectual interest, Pr4, is also closely related to these, but with the difference that it is much less correlated with aggressiveness and enthusiasm. Professors' estimate of perseverance seems to be slightly distinct from all these. This intellectual group is nevertheless positively correlated, though low, with aggressiveness. It comes nearest to negative correlations with gregariousness and personal appearance. The most negative correlations are between handsomeness and Pr4 and Pr7 (—.16 and —.19).

Although the correlations of the correlations were not computed, a rough step in this direction was taken as follows (using here the raw coefficients): The 8 traits most clearly interrelated at the social pole of the system (J1, 2, 5, 9, 10, 15, 18 and "pop") were taken in all possible combinations of pairs, and the average of the 12 differences between the correlations of the two members of the pair with 12 other traits were found. These figures hence give an index of the relative agreement of the two traits in their correlations with other traits. Measured thus, the closest relations were, in order, as follows:

Aggressiveness and enthusiasm.....av. diff	.076
Bodily activity and cheerfulness.....	.086
Popularity and handsomeness.....	.092
Bodily activity and desire for admiration.....	.094
Bodily activity and aggressiveness.....	.097
Bodily activity and enthusiasm.....	.098

The sum of these average differences for each trait with the other 7 of the group were then computed. On this basis handsomeness was found to be much more distantly related to the group than any others. It was then thrown out, and the same data computed for the other remaining 7 traits. The results of this show that the most closely related to all the others of the group—the most central—of the group is bodily activity; then follow in order desire for admiration, cheerfulness, gregariousness, enthusiasm, aggressiveness, objective popularity score. This is all very rough, but it seems to indicate that although handsomeness and popularity are highly

related to all the social traits, that neither is the central nucleus or general factor of the system. Neither is aggressiveness, which seemed at first to be the feature of central interest. The general factor if such exists would seem to be something more in the nature of sthenic emotionality or activity, or energy. This conclusion is only tentative, and awaits testing by other data. We have always to consider that such results as this may depend on what traits are included in the system, which is usually a selected and limited one as compared with the whole compendium of human behavior traits.

The other general factor, if such it may be called, is something in the nature of persevering intellectuality—not so much intellectual ability but interest and effort. This has a low positive correlation with the social-emotional factor. General intelligence runs in between the two, so to speak; correlating with both but more highly with the intellectual factor. Professors' estimate of intelligence is almost identical with the latter.

Of the traits judged by both professors and classmates, aggressiveness (J1 and Pr2) shows the highest agreement (+.97 corrected); general intelligence is next best (+.83), and perseverance is only +.63. The agreement between professors' "intellectual interest" and classmates' "mental activity" is higher than any of the above, being +.99. The perseverance of the professors' estimate seems to be a somewhat better distinguished trait than J13, for the latter correlates better with Pr4 and Pr1 than with its namesake Pr7. Perseverance was evidently taken by the students as meaning something very close to intellectual application. General intelligence as judged by students seems to be biassed by the social qualities, as witness its correlations of +.67 with aggressiveness, +.35, with handsomeness, and +.38 with popularity. The professors' estimate of intelligence on the other hand is neutral to handsomeness, popularity and athletics. This is similar to the result found by Webb in his study, discussed later. He found that the judgments of students in intelligence qualities by their student prefects were biassed by sense of humor, from which bias the lecturers were free. Self-confidence justified the a priori expectation of it—that it would be correlated with aggressiveness, being supposedly a product of the same instinct—masterly behavior or self-assertion.

4. *Physical Data*

The physical measurements and strength tests had been taken on these men three years previously, 6 out of the 76 had records missing.

The measurements were treated according to the method of Mr. C. K. Taylor, as outlined in his handbook "The Physical Examination and Training of School Children." (57). The data were not sufficient to allow our getting the full advantages of this treatment, since two of the most important measurements were lacking: namely, (1) the difference between biceps contracted and biceps relaxed, and (2) the difference between chest fully expanded and chest fully deflated. A variable "Taylor Points" was computed, using the 6 available measurements: upper chest expanded, right biceps contracted, left biceps contracted, hips, thigh average, calf average. From these data the following results were found:

(1) The correlation between the Taylor score (i. e., a score which evaluates not the absolute measurement, but the extent to which it exceeds the *norm* for the *height and weight* of the given individual), for chest and the two biceps with that for hips, thighs and calves, was zero. Hence there is revealed here no factor of *general development* affecting all parts of the body.

(2) The correlation of "Taylor Points" with stature is $-.47$. Mr. Taylor thinks this is sound, and indicates a real lack of development, in his sense, of the taller men. The correlation of Taylor points and total strength is about $+.10$, but would approach $+.40$ except for 7 individuals who depart widely and inconsistently from the regression lines. The Taylor score has no correlation with weight, and $+.39$ with vital index $\frac{L. C.}{Height^3}$.

Correlation of Taylor Points with aggressiveness $=+.18$. Stature and aggressiveness—very low positive correlation estimated, not over $+.15$. Aggressiveness and total strength, estimated 0 or very low. Bodily activity and total strength, estimated low positive (not over $.15$).

Aggressiveness and $\left\{ \frac{\text{weight}}{\text{height}^3} \right\} R \text{ estimated} = 0$.

Bodily activity and $\left\{ \frac{\text{shoulder measurement}}{\text{waist measurement}} \right\}$ very low positive.

Cheerfulness and $\left\{ \frac{\text{weight}}{\text{height}^3} \right\} R = 0$.

The latter is the supposed correlation between stoutness and cheerfulness. By the percentage of unlike signs, however, this correlation is $+.30$. We have here the same phenomenon as elsewhere in the investigation: according to the *number* and *direction* of pairs of deviations, there is correlation; but

when these are weighted for *degree* of deviation, the correlation is reduced considerably. That is, the exceptional or minority cases deviate so widely from the general trend of the majority as to neutralize the effect of the latter. In such cases a correlation coefficient computed from a simple four-fold association table may have more meaning than one computed in the usual manner.

5. *Advertisement Experiments.* At the outset of this investigation the leading purpose was to find possible tests for character analogous to the many tests now used for intelligence. It was thought possible that an individual's reactions to various words, phrases, pictures, etc., might be some indication of his general behavior tendencies. If any such tests should correlate with estimates of behavior, then we might be on the track of a method of inferring character from tests without the need of prolonged acquaintance and observation. The initial suggestion toward such an attempt was given by H. T. Moore's suggestion for testing the strength of instincts (42). He takes 10 instincts as provisional units of behavior and tries to test the strength of these instincts by a special form of association test.

It seemed very dubious to the writer that the reactions to these word stimuli would bear any simple relation to the strength of the instincts which the word supposedly arouses. If any tests of this nature were valid, it seemed that a direct statement of likes and dislikes—a frank comparison of various stimuli by the subject according to their strength of appeal to him, would be more likely to indicate the strength of his instincts than would the association test.

Dr. Hollingworth has used the advertisement tests extensively, but has never treated them for individual differences. It seemed worth while to study this kind of data from the differential viewpoint, whatever the final outcome.

Forty-eight advertisement appeals were used as described above. Most of them were taken from Dr. Hollingworth's sets, and the rest were made up specially for this investigation. They were selected with a view to stimulating certain important instinctive-emotional tendencies, as far as such tendencies can be stimulated in this way. (See table below). Thus advertisements Nos. 1-8 are designed to stimulate self-assertion or masterly behavior; Nos. 9-18 are appeals to the social instincts; Nos. 19-32 appeal to interests in *things, mechanisms* and *advantages*, or the material itself; Nos. 27-32 especially appeal to the manipulative-constructive tendencies; Nos. 43-46 to the affectionate-kindly tendencies, and the appeals of others are obvious.

A priori it might seem that an individual whose instinct of self-assertion were strong (if such an instinct is in any sense a unit of behavior) would be judged high in aggressiveness by his classmates, and also would tend to be influenced relatively intensely by verbal appeals to this instinct. But also we might expect inhibiting and compensating factors which would eliminate this correlation and even make it negative.

The rank (1 to 24) given to each slip by each subject was recorded; then the ranks of two corresponding slips of the two sets were summed (Nos. 1+2, 3+4, etc.) The last column below (Table 3) gives the reliability correlation for each of these pairs: i. e., the correlation between the rank given to a given slip in the odd series and the rank given to its corresponding slip in the even series. This coefficient tells how nearly the two slips actually do approach to being the same general appeal, as they are supposed to be. It is evident that in several cases, the differences in wording have greatly changed the value of the appeal and obscured the common element which the writer tried to put into the two.

All the intercorrelations between advertisement ranks, except where noted, are computed by the method of percentage of unlike signed pairs, using Professor Thorndike's table. (61, 2d edition, p. 171, 228).

This method gives theoretically, a short cut approximation to the Pearson coefficient. The variable error between the value thus obtained and the fully computed coefficient will be, however, large in this study, because of the small number of cases. But, as noted elsewhere, with some correlations found in this study, the short cut method has in addition a large constant error in the direction of making the values higher than would the full computation. Where a coefficient is designed as "estimated," it means that it was obtained by this method, using Thorndike's table; "computed" means it was obtained by the regular Pearson formula. In correlating ranked data with other variables not using ranks, the sign will of course be reversed, since the original form of the ranked data is that low numbers mean high values of the interest or appeal, and vice versa. All coefficients will be stated here so as to show the true *meaning* of the correlation.

Nearly all the correlations between corresponding slips are positive and sufficiently high so that we may consider them provisionally as representative of the same general appeal. The only negative correlation is that between "Economical" and "Bargain."

The corresponding slips were combined so as to make 24 appeals instead of 48. These will be designated by the number

of the slips involved: thus (Adv. 1+2), (Adv. 5+6), etc. Then by the method of percentage of unlike signs, the intercorrelations between these 24 appeals were estimated. They are given in Table 4. These coefficients tell us what appeals are relatively associated with each other—tend to be evaluated alike, and what appeals are relatively opposite. Where the coefficients are numerically high, we may say in general that if an individual in this or a similar group reacts favorably to a certain appeal, he will probably react favorably (or unfavorably) to a certain other appeal. These figures also serve to test the *a priori* theories that certain appeals would be closely related because they seemed to arouse the same general emotional tendencies, etc.

In interpreting correlations between these *ranked* data, such as the advertisements, and the interests in studies, it must be borne in mind that we are dealing with *relative* and not absolute interest values. Since the values are expressed in ranks, there *must be* negative correlations, although no negative correlations might exist between the absolute values of the interest. Moreover, the smaller the number of the ranked items, the more must the negative correlations predominate over the positive ones. If we had only two items, the correlation between their ranks must necessarily be -1.00 . If we had only three, their average intercorrelation would be necessarily some rather high negative value, which could be determined if desired, by statistical formulæ. Hence, with all this material, it is the *order* of the correlation coefficients and not their actual values, which is chiefly significant.

The most conspicuous correlations are those between the advs. (1+2), (3+4), (5+6) and (7+8). These were all designed as appeals to different aspects of the self-assertive or mastering instinct, and they prove to be so well correlated that we have combined them into one large composite which we shall henceforth treat as one variable, calling it the "mastery composite." The Pearson coefficient between advs. (1+2+3+4) and (5+6+7+8) was computed in the regular manner and found to be $+.61$. It would seem then that the tendency to react favorably to appeals of this general nature is a fairly well defined thing. Whether it bears any relation to actual strength of the self-assertive behavior tendency is a different question.

The two kindness appeals (43+44) and (45+46) are found to be correlated and are combined to form a "kindness composite." The advs. 9 to 18, inclusive, were designed as appeals to the tendencies called social instincts, including sensitiveness to social approval and to convention and fashion.

TABLE 4
INTERCORRELATIONS OF ADVERTISEMENTS

	Leadership	Power	Mastery	Dignity	Self reliance	Approved by thousands	Stylish	Civic pride	Up-to-date	Progress	Conservative	Rare value	Durability	Stands the strain	Expeditions	Time saved	Efficiency	Gets results	Standard	Ingenity	Mechanical accuracy	Hygienic	Tempting	Purity	Cleanliness	Economical	Self defence	Sympathy	Friendship	Weird
1+2																														
3+4																														
5+6																														
7+8																														
9+10																														
11+12																														
13+14																														
15+16																														
17+18																														
19+20																														
21+22																														
23+24																														
25+26																														
27+28																														
29+30																														
31+32																														
33+34																														
35+36																														
37+38																														
39+40																														
41+42																														
43+44																														
45+46																														
47+48																														

S + Subjective sentimental group. O + Objective group.

But there is little consistency in their correlations and they cannot be combined into a meaningful composite.

Advs. (19+20) and (21+22) correlate +.44 (percentage of unlike signed pairs) and also show great similarity in their correlations with other appeals. They may be combined to form a variable representing a "quality of material" interest. It is to be noted that this is opposed to the mastery composite and slightly opposed to the kindness composite. This variable correlates positively with the following:

	(19+20)	(21+22)
with (17+18) (conservative + normality).....	+.27	+.19
with (23+24) (time saved + expeditious).....	+.15	+.41
with (27+28) (scientific and standard).....	+.15	+.48
with (29+30) (ingenuity + inventive genius)....	+.06	+.17
with (31+32) (mechanical accuracy + control)...	+.39	+.25
with (37+38) (purity + cleanliness).....	+.39	+.25

On the other hand, the mastery composite correlates negatively with all these variables, except (17+18). Leaving this one aside, it will be observed that the other five, together with (19+20) and (21+22), refer to advantages of a relatively objective and mechanical kind—they direct attention to the commodity itself and its characteristics.

Now there are two ways of classifying traits or appeals or tests or other variables. One is the a priori common-sense way of putting together those which seem descriptively similar; and the other is to put together only those variables that show positive correlation, when statistically investigated. The a priori classification of these appeals was according to the instincts—mastery, social instincts, kindness, manipulation-constructiveness. The correlations throw a somewhat different light on the classification. The advs. fall into two opposing major groups, as described above. The central element of the one group seems from inspection of the copy of the advertisements to be a kind of emotional, sentimental, self-reference. The other group seems to center about a relatively unemotional objective interest in the characteristics of the commodity itself.

Now we selected 8 appeals which best represented the first group and 8 appeals which best represented the second, combined them to form two composite variables, and subtracted the second from the first, thus forming a differential variable designed to measure the "relative strength of the objective, thing-quality interest, as compared to the response to appeals of a sentimental, subjective or self-referring nature." We labelled this variable for convenience "objve." The appeals to make up these two groups were selected primarily on the basis of

their correlations, but secondarily, their descriptive content was also considered. Everything put into the sentimental group had a positive correlation with the mastery composite, except (43+44) which it was not desired to separate from (45+46). (39+40) was put into the objective group because it of all the remaining appeals had the highest average correlation with the 5 already admitted to membership in this group. The variable "objve" then was composed of advs. (1+2+3+4+5+6+7+8+15+16+17+18+43+44+45+46) — (19+20+21+22+23+24+27+28+29+30+31+32+37+38+39+40.)

Calling the favorable response to objective appeals its plus pole, the variable "objve" gives the following correlations. These correlations are computed by the formula given by Yule for finding the correlation from a two-by-twofold table.

$$\text{it is } R = \frac{N\delta}{\sqrt{(A)(a)(B)(\beta)}} \quad 75, \text{ p. 217.}$$

This is found in practice to give values numerically lower than the percentage of unlike signed pairs method using Thorndike's table, and usually higher values with this kind of data than the regular Pearson formula. It is suggested elsewhere in this paper that either of these methods may for variables like those derived from the advertisement tests, have more meaning than the full Pearson computation.

with cheerfulness.....	— .32	general intelligence	
enthusiasm	— .21	(Pr1)	+ .05
gregariousness	— .16	general intelligence	
perseverance (J13) . .	— .16	(JX)	+ .08
aggressiveness (J1) .	— .13	aggressiveness (Pr2)	+ .08
desire for admiration	— .13	bodily activity.....	+ .08
kindness	— .11	mental activity.....	+ .08
perseverance (Pr7) .	+ .03	self confidence (Pr	
handsomeness	+ .05	6)	+ .11
personal appearance		intellectual interest..	+ .16
(J16))	+ .05		

While none of these correlations individually is high enough to be significant, except perhaps the first, the *order* in which they fall, and the differentiation between traits which correlate together very high, do appear significant. The "deeper" emotional traits of the social group, as distinguished from those of objective interests and activity and the objective aspects of the same group of traits, are the ones which most correlate with the responses to the subjective-sentimental appeals. There is then a definite correlation between emotional behavior as judged by fellows and the tendency to react positively to appeals verbally symbolic of the normal stimuli to emotional behavior. If we could find a method of measuring

such relationships which would discover and evaluate the factors which neutralize the correlation, we should have something very significant.

No correlation could be found between this "objve" and per cent of play time in childhood spent alone, nor with the degree of self-reference or interpretation in terms of self of the answer to question 13 of the questionnaire, nor with fondness for reading fiction, nor with interest rank of the studies psychology and literature. One result does, however, add a little argument in favor of considering this "objve" as related to something basic and important. In the answer to question 8 concerning vocational choice and motives, 13 men out of the 73 who answered gave "service" to mankind, or its equivalent, as one of the motives for their choice. Of these 13, 10 men were minus in "objve," i. e., favored the sentimental appeals, the other 3 being plus. Of the 13 who mentioned "service," 9 gave it as the first and foremost motive of choice, and of these 9 only one was plus in "objve." The average "objectivity" value for the 13 men was $-40.4p$, while the average of the whole group of 73 was $+03.7$. Standard deviation of the whole group $67.4p$, of the service men $71p$. P. E. of the average for the 13 service men is $12.6p$. Hence they deviate from the group average by $3\frac{1}{2}$ times their probable error, and from the mean of the 60 non-service men by over 4 times their probable error.

Other correlations of the advertisements with the traits:

	zero	fourfold table formula	Pearson
J1 and advs (1+2+3+4)			
J1 and advs (1+2+3+4+5+6+7+8) (‘mastery comp’)			
J4 and advs (43+44+45+46)	zero		$+08$
J5 and advs (9+10+11+12)			-20
J16 and advs (11+12)			-24
Pop. and advs (11+12)			-35
J18 and advs (33+34)	zero		-19
J10 and mastery composite			$+24$
J9 and mastery composite			$+19$

Thus, although the mastery composite does not correlate appreciably with aggressive behavior, it does correlate somewhat with emotional behavior traits. The tendency to respond favorably to "stylish" and "nobby" is negatively correlated with actual neatness of dress, and estimated desire for popularity. This seems to be due to a conventional distaste stronger among the more social groups. Kindness fails to correlate with the kindness composite.

An inspection of several correlation graphs between traits and advertisements reveals a definite trend of the mass of

cases in the direction of the expected correlation, but with smaller isolated groups of points widely separated from this trend which tend to neutralize or reverse the correlation. The correlation between enthusiasm and the "mastery" advertisements illustrates this. If it were not for the outlying groups of points in the first and third quadrants, there would be considerable correlation between these variables. This is further illustrated by the fact that often fairly high correlations are found by the unlike signs table or the fourfold table formula, but the regular Pearson computation makes these coefficients much lower—even to zero. This is because the few cases in the minus quadrants (or plus, as the case may be) of the graph are relatively distant from the origin, and hence their weight in the product sum balances the weight of the majority of cases in the other quadrants. For variables of this kind the correlation computed from the fourfold association table would seem to have more meaning than the full Pearson computation, for the former gives no credit for degree of deviations from the mean, but only their number and direction.

The interpretation is suggested that there is a real and high correlation between enthusiasm and the tendency to respond favorably to such appeals, but that this is nearly neutralized by two groups of cases: (1) those lacking in the trait who as compensation for their lack or from some other cause, have developed an "unnatural," so to speak, favorable response to the appeals; and (2) those who, high in the trait, have through unpleasant association or a conventional distaste or contempt, repudiated the appeals to which they "naturally" would respond. In general, we may be very skeptical about inferring from an individual's responses to words his responses to actual situations. This is the afferent or stimulus aspect of what is popularly termed "bluff."

QUESTIONNAIRE DATA

6. *Personal History.* *Age.* Average of the seniors on November 15, 1916, when the investigation began, was 21.84 years. It was thought that age might have something to do with the character traits, especially with aggressiveness. This was tested, and there was found to be no correlation between age and aggressiveness. The extreme range of the ages was from 20 to 24½ years.

Parental occupation. It was thought possible likewise that the social and financial position of a man's family might have some influence on his ability to attain popularity, and hence

be judged aggressive, etc. This was roughly tested as follows:

Average popularity score of the 12 men whose fathers had such occupations as farmer, laborer, carpenter, clerk, mechanic, 300p. Of 8 men whose fathers were lawyers, physicians, dentists, and large business executives, 285p. P. E. of the latter average, about 19 points. The difference is hence less than the probable error. Again, this comparison:

	Agressiveness. (Jr)	Intelligence (Pri)
Mean of whole class.....	293p	338p
Mean of 16 sons of professional men.	307p*	385p
P. E. of latter mean.....	12p	14p
Standard deviation of whole group...	70p	75p

Thus the sons of professional men are above the group average by about $3\frac{1}{2}$ times their probable error in intelligence estimated by their instructors, but in aggressiveness the difference is not significant.

A brief inspection of the occupations of parents shows that there is no factor of wealth distinction that would have any influence here. The spirit of the institution is such as would make a man's prestige mainly dependent upon his appearance, behavior and ability.

Employment (Questions 4 and 5). There is no significant correlation between amount of employment in college and popularity or aggressiveness. The half of the men who have done the most toward working their way through college exceed the other half in both popularity and aggressiveness, but by only the amount of the probable error. The 27 men who mention the more unskilled and undesirable jobs as part of their employment while in college exceed the rest of the men in popularity by nearly twice the probable error; 56 out of the 76 men have had some employment while in college, outside of summer work. This includes all kinds of work from tending furnaces to tutoring or running Sunday schools. There is no correlation between popularity and total amount of employment and home duties before and during the college course.

Early environment (question 2). Figures are given in class intervals as units.

	No. of men	Aggressiveness	P. E.	Popularity	P. E.
Farm	10	-1.50	.60	-.80	.66
Town or village under 8,000	22	+.73	.40	+1.63	.44
City 8,000 to 100,000.....	23	-1.30	.41	-1.13	.43
City over 100,000.....	21	+.38	.41	-.09	.45

Most notable here is the superiority of the men from the smaller towns over those from small cities, amounting to 5 and 6 times the probable error.

Degree of companionship in play. (Question 6.) The percentage of time estimated to have been spent alone, with chums, or with gangs, when a boy, have no direct relation to present estimates of behavior. The nearest to a significant correlation is $+15$, Pearson computed, between popularity and the variable 'per cent of time spent in gangs minus per cent of time spent alone.'

7. *Interests.* Question 10 gives us the ranking of 9 types of studies in their interest values for each individual. The 3 men who failed to answer were assigned the rank 5 in all studies, this being the mean value of all the data. Each study then becomes a variable which can have 9 possible values, the integers from 1 to 9. The means and standard deviations of the 9 study-interests are given below. Remember that here as with the advertisements, a low number means a high interest value, and vice versa.

	Mean.	Standard deviation.	Rank for group.
A. Mathematics	4.64	2.66	2
B. Languages	5.45	2.48	8
C. Literature	4.94	2.18	6
D. History	4.39	2.12	1
E. Physical, mechanical sciences.	4.89	2.67	5
F. Chemical sciences	4.69	2.58	3
G. Biological sciences	5.24	2.81	7
H. Psychological sciences, philosophy, etc.	5.97	2.64	9
I. Economics, politics, etc.	4.76	2.27	4

The correlations between these 9 study variables, estimated from the percentage of unlike signs, are given in the following table. The figures in the lower parts of the squares are the true Pearson coefficients computed in the regular manner, where such computation has been made. Evidently the unlike sign method here also gives coefficients usually too high.

A study of these correlations shows what would be expected, an association of the natural sciences on the one hand, and at the opposite pole, the studies history and literature. It must be remembered that these variables are like the advertisements not absolute, but relative interest values, as is necessarily the case where ranks are used. Hence there *must* be negative correlations and since we have only 9 items, the most probable correlation between any two is not zero, but somewhat less. Justified by their correlations, we now combine the 3 variables E, F, G, and get a composite variable that we call "relative interest in the natural sciences" (studies $E+F+G$). Likewise we combine $C+D$. Then these two composites were subtracted to get the differential variable ($E+F+G-C-D$)—"interest in the natural sciences minus interest in the humanities." In making this combination the variable ($C+D$) was first multiplied by 1.60 so as to make its mean and standard

TABLE 5
INTERCORRELATIONS OF INTERESTS IN STUDIES

	A	B	C	D	E	F	G	H	I
Math. A.									
Lang. B.	-.40								
	-.27								
Lit. C.	-.24	+.28							
Hist. D.	-.40	-.12	+.40						
	-.24	+.03	+.26						
Phys. E.	+.58	-.40	-.55	.50					
Chem. F.	+.32	-.50	-.73	.50	+.58				
					+.39				
Biol. G.	-.08	-.20	-.61	.48	+.04	+.61			
					-.05	+.41			
Psych. H.	-.48	-.12	+.08	0	-.44	-.48	-.24		
			+.14						
Econ. I.	-.39	-.08	+.12	+.20	-.32	-.44	-.51	+.28	
			+.03					+.38	

In ordinary type = method of unlike signs.

In bold face type = regular Pearsons.

deviation approximately equal to those of (E+F+G), in order that both factors might have equal weight in the composite.

There is no correlation between the number of the advertisements actually disliked and the number of studies disliked.

Recreative activities. Question 9 enumerates most all the important types of recreative activities common to young men. It is purposely made comprehensive; most any other activities that could be mentioned could be brought under this classification. These activities are evaluated as to interest not by ranking, but by the use of one of the 4 possible marks as indicated in the instructions. The variables are hence absolute rather than relative interests. In making up the variables, the marks were evaluated thus:

— 0 points; + 1 point; ++ 2 points; +++ 3 points.

For the present study, the separate items were not intercorre-

lated, but on the ordinary descriptive criterion alone were added up to form 5 more generic variables, as follows:

Activities column 1: competitive athletic sports, 6 items: baseball + football + basketball + tennis + boxing + wrestling.

Act. col. 2: less competitive, more individualistic sports, 8 items; swimming + rowing + canoeing + bicycling + track and running games + jumping and vaulting + gymnasium work + skating.

Act. col 5: aggressive-social activities, 3 items: public speaking or debate + running or directing social and business affairs, meetings, etc., + business contact and interviews with men.

Act. col. 6: non-aggressive social activities, 3 items: taking part in amateur dramatics or entertainment + attending club, fraternity, or class meeting, smoker, etc. + meeting strangers.

Act. col. 7: manipulative-experimental activities, 3 items: building or making something + experimenting with mechanical or electrical apparatus + experimenting in chemistry or biology.

This classification is of course open to objection: it is simply a provisional grouping of activities according to the instinctive behavior roots, just as the traits and advertisements were grouped.

The following correlations were found:

(1) between the activities themselves.

Competitive sports and less competitive sports $R=+.41$ (Pearson.)

Aggressive and non-aggressive social activities $+.46$ (Pearson.)

This justifies our combining the variables to form these new compounds:

Act. col. (1+2), "total athletic sports."

Act. col (5+6), "total social activities."

Now we find the correlations:

Total sports and total social activities, estimated $R=0$.

Total sports and manipulative activities, estimated $R=\text{very low } +$.

These data seem therefore to be reliable and consistent: like groups of interests correlate with each other, and unlike groups, in absolute values, are independent of each other. As we should rather expect, if a man were fond of certain social activities, he would likely to be fond also of other activities involving many of the same elements of stimulation, but we should have no clue as to his fondness for athletics or constructive activities.

(2) Correlations with other variables. "Total sports" interest has no significant correlations with the qualities aggressiveness, enthusiasm, mental activity, perseverance, intelligence, or even with bodily activity and athletic achievement. Neither part of the sports composite has any relation to ag-

gressiveness. "Subjective" fondness for sports and exercise evidently has no relation to the tendency actually to engage in them under the college organizations and to succeed in them.

"Total social activities" has a computed Pearson correlation with aggressiveness of $+.36$. This shows that the subject's report of his own interests and dislikes is not an arbitrary meaningless thing. This variable has a correlation with desire for admiration of $+.40$ (Pearson). Its correlation with objective popularity score, computed, is only $+.16$ (Pearson). Thus fondness for social recreations is more related to aggressive, popularity-desiring behavior than to the actual prestige obtained.

Act. col. 7, or fondness for manipulative-constructive recreations, has the following correlations:

With professors' estimate of manipulative constructive interest, trait Pr3 (obtained for the 46 technical men only), $R = +.45$ (computed Pearson), P. E. $= \pm .08$.

With studies (E+F+G), "interest in the natural sciences," $R = +.53$ (Pearson). With advs (19+20+21+22+27+28+29+30+31+32), the quality-of-material-technical appeals, $R = +.16$.

We now make up another differential variable by subtraction of act. col. 7 from act. col. 6, i. e., "fondness for social recreations as compared with fondness for manipulative-experimental-constructive activities." In doing this, the two component variables are first put in terms of their respective standard deviations, so that the two parts may have equal weight in the result. Now this differential is correlated with the differential variable described under study interests, "interest in the natural sciences as compared with interest in history and literature." The Pearson coefficient, regularly computed is $+.53$, giving the sign according to the true meaning of the correlation. Now we have two variables, correlated $+.53$ with each other, one derived from study interests, and the other from recreations, which seem to measure a common factor "interest in human relationships and character as compared with interest in things and their mechanisms." This is the trait which Prof. Thorndike mentions as a rather important variable of human nature, being for one thing one of the chief directions of greatest variation of men from women. (60, vol. 3, p. 201.) If we now combine these two, by reducing each to multiples of its own standard deviation and adding, the resulting variable will be the best measurement we can make of this trait with the data in hand. This we shall designate for brevity "(hum.-mech.)"—"human minus mechanical interest."

This (hum.-mech.) has the following correlations:

With aggressiveness (J1), $+.24$ (computed Pearson.)

With desire for admiration, $+.25$ (computed Pearson.)

With kindness and gregariousness, low positive correlations are estimated.

With most of the other traits, and with popularity, the correlations estimated by percentage of unlike signs are zero.

With the advertisements of the quality-of-material-objective group, and with this compound as a whole, the correlations are very low negative, the only significant one being with (31+32), which by unlike sign method is $-.40$.

It is rather significant that the tendency to be interested in human rather than mechanical affairs is slightly correlated with aggressive and social behavior as judged by fellows. If it were legitimate to correct the above coefficients for attenuation due to assumed errors in the measurement of (hum.-mech.), the correlation would be raised to $+.30$. This is suggestive of Veblen's classification of humanity in his "Theory of the Leisure Class" (66, 67), in which the dominating, predatory, exploiting character on the one hand is opposed to the mechanical-minded workmanship character on the other. Before taking this too seriously, however, we should like to see this correlation computed in other kinds of groups. If any such correlation were found to be true in high degree in the universe of the whole population of a country, we should still have to inquire whether it was due to original nature, or to early experience of a relatively individual and independent kind, or to the culture and traditions of different social and occupational groups.

This (hum.-mech.), however, it may seem to resemble the variable "objve" derived from the advertisements, is a very different thing, as its correlation with the latter is practically zero.

The answers to question 7 were evaluated simply by judging them as wholes, giving them 4 possible grades: 0 for complete denial of any mechanical or constructive activities in childhood, 1 for some such, 2 for much, 3 for very much, as well as could be inferred from the answers. This degree of childhood mech.-constr. interest correlates with:

Act. col. 7, present manipulative-experimental activity interests, $+.40$.

With studies (E+F+G), the natural sciences, $+.06$.

Both coefficients Pearson computed.

Thus the childhood activities bear some relation to the present fondness for the same general kinds of activity, but very little to present interest in science in general.

III.

GENERAL DISCUSSION IN RELATION TO OTHER WORK IN THIS FIELD

The general orientation for classifying behavior traits was derived in this study from Thorndike (60, Vol. 1) and McDougall (40), especially the former. Dr. Thorndike's seems to be by far the best description and classification of the original tendencies; and it is especially desirable because phrased in terms of behavior. From the physiological work of Cannon (8, 9), Crile (13, 76), and the Freudian psychology as interpreted by Trotter (64, 65), we seem to have a very good basis for classifying all the original tendencies in the four great instinct groups of nutrition, reproduction, self-defense and herd-instinct. To this perhaps a fifth group might be added, including many subsidiary instincts such as curiosity, vocalization, manipulation, whose function is a more indirect and long-range adaptation. The present study fails to give satisfactory evidence either for or against using as basic variables for differential psychology the several instincts, or the four great instinct groups.

Wells gives a particularly good classification of character variables, which unlike many others is dynamic and is devised with regard for the balancing and compensating mechanisms of character. It is especially significant because it suggests how functional data such as the Freudian method gives can be translated into statistical variables for correlation (71).

Schneider's list of traits for classifying men and jobs is very significant in that it shows a tendency to classify in terms of *stimuli*, instead of simply enumerating vague "qualities." Thus several of his items answer the question: How does the individual react to certain very frequent stimuli which are common elements of many situations of daily life and occupation? (49.) A man's efficiency in his vocation may depend very largely upon these conditioned reflexes that he has formed to certain stimuli. Take the case of one who is made ill by riding on trains, or one who is always angered by criticism, though not a pugnacious person in general, or one who cannot endure staying indoors. This inadaptability to indoor work may not best be interpreted as due to some general quality of restlessness, or adventurousness, or lack of concentration, or whatnot, but as a reaction to the specific situation "indoors," brought about by a past association of this stimulus with unfavorable or annoying conditions. Hence if we could draw up a list of *situations* that are frequent and vocationally significant, such as "responsibility" vs. "carefree-

ness," "having to wait," "uncertainty," "being criticised by a superior," "routine," "outdoors," "disorder," "machinery in general," etc., and catalog the individual's reactions to these, we should have a better record of his character than a list of reactions in general. It would be still better to specify each stimulus more in detail for each individual, because, for example, a man may react favorably to some kinds of routine but not to others.

It has been also a favorite activity in this field to classify men into types on some anatomical basis and then to assert that various mental characteristics are associated with or indicated by the anatomical characteristics. Some of these attempts have been the grossest charlatanism; in other cases there is plausible scientific evidence, on a priori grounds, to expect the alleged correlations. But nearly all such attempts, even those made by scientific men, fall down because they fail to demonstrate statistically that the correlations actually exist.

Thus, Lewis (39) has summarized excellently much recent medical literature by Bryant (7), Goldthwait, and others, on the so-called carnivorous and herbivorous types in man. From the descriptions of the types we gather that the chief variable—the central differentiating factor between the types, is bodily fullness, or, in statistical terms, height-weight index. In fact, some of the writers would substitute the words "heavy" and "slender" for "herbivorous" and "carnivorous." That certain diseases and bodily characteristics are associated with the heavy type, and others with the slender, we will not at present question, although we should like to see their medical evidence presented more in statistical form—in correlation coefficients.

But when statements like the following appear, the patience of the statistical psychologist is at an end. Thus, Bryant says:

"The carnivore is the restless pioneer, inductive, dying ever on the outskirts in search of something new."

"The herbivore is the sedentary stabilizer, deductive, ever at his appointed task."

The editor of the Boston Medical and Surgical Journal, in discussion of this, says:

"Racially the carnivorous type is more active, energetic, and dominant; the herbivorous type is more stable, artistic, contemplative. . . . The herbivorous type tends to survive by virtue of its stability, the carnivorous by its superior energy and versatility." (39, p. 302.)

Now the present study fails to show any significant correlation between weight-height index and the traits aggressiveness or perseverance, nor with any of the traits. With ag-

gressiveness, which certainly measures or correlates very high with the mental characteristics just ascribed to the carnivorous type, the correlation by the method of unlike signs is $+.09$, which is in the wrong direction if thought suggestive even. With perseverance the correlation by unlike signs is $+.18$. A differential variable of aggressiveness minus perseverance was made up: this measures the degree to which each man's aggressiveness, in terms of its standard deviation, exceeds his perseverance in like terms. The graph of the correlation of this variable with weight-height index shows not the slightest sign of more than strict neutrality.

The research most nearly comparable with this is Webb's study on English college students and schoolboys (70). Webb's correlations differ from mine in being in general lower. He has many negative coefficients. This is probably due to his using more traits and more specific traits, and to his having judges who trained for the task by observing their subjects closely. He had only two judges to each subject, and 20 subjects for each judge. The reliability coefficients averaged about $.50$, not varying greatly from trait to trait. He had 48 variables, of which 46 were judgments. His correlations in general agree roughly with mine. Among the chief specific differences are that in his study kindness is more highly correlated with the perseverance and intelligence traits, and that there is a much wider opposition between these latter and the "lighter social qualities," as he calls them.

By Spearman's criterion that the correlations of correlations should be ± 1.00 , Webb finds two "general factors;" one the "general intellectual energy" of Spearman; the other, of which he is the original discoverer by statistical methods, is something related to persistence, or will, or consistent reaction. He finds his clue to this in notable differences between the correlations of quick intelligence and those of profound intelligence. With the former are related more highly the traits (a) readiness to anger, eagerness for admiration, and bodily activity in pursuit of pleasure. With the latter go relatively more: (b) perseverance traits, kindness on principle, trustworthiness, conscientiousness. Now the groups (a) and (b) both satisfy Spearman's criterion within themselves, and each gives correlations of correlations of -1.00 approximately with the other. He concludes that these groups of traits represent the opposite directions of some fundamental general factor "w," "that a second factor, of wide generality, exists, and that this factor is prominent on the 'character' side of mental activity (as distinguished from the purely intellectual side)" (70, p. 58). He relates this

"w" to the perseveration tendency of Muller and Pilzecker (43), the secondary function of Heymans and Wiersma (28), the secondary function of Gross (25), the interference of Culler (14), the will of Ach (1), and to various observations of character differences by Meumann and Partridge (47).

Lankes (37) has tested this perseveration hypothesis, and although he found a correlation of $+.86$ between tests of perseveration and a weighted interrogatory concerning phenomena of personal experience (such as feeling the motion of a boat for a time afterward) supposed to be indications of this tendency, on the other hand estimates of persistence qualities of character correlated negatively with the tests and the interrogatory!

What general factors shall be found in this way may depend largely upon the purpose and interests of the investigator and the list of traits used. It is possible that Webb could have found other general factors in his traits, and it is also likely that the "w" he found might better be interpreted in another way. It might for example be a differential variable of the still more fundamental factor of energy-emotionality in general minus a learned factor of morality and repression. We are at least impressed by the general moral coloring which pervades this persistence group of traits—it includes religious interest, pure mindedness, while the (a) group includes anger, superciliousness, etc.

In regard to "general factors," the following possibility, though speculative, must be borne in mind. In all judgments of human behavior, the subjects judged are in a particular environment and known to the judges in selective respects only. No judge and no list of traits covers exhaustively all the characteristics of behavior. Every environment tends to make conspicuous individual differences in certain respects but to conceal differences in others. Thus my study made the two axes of greatest variation, so to speak, the social traits on one hand, and the intellectual on the other. These might be not as fundamental as supposed, but simply *the* two variables which the college environment and traditions *select* as most important and emphasize in the minds of observers. In a business office, differences in general *efficiency* would loom up large and obscure many differences noticed in college life. Furthermore, the environment and resulting selection of conspicuous differences determine to some extent what traits can be used for judging, and the interpretation the judges will put upon the traits that are used. The only way to get an unselected list of traits would be to gather them equally from all the original tendencies, as described for example by Thorndike.

A careful study of the correlations such as Webb made and I have made to some extent, may get beneath what seem superficially to be the important factors, and reveal such more basic factors as his "persistence" and my general emotionality and energy, but we cannot be sure that even these are free from the bias discussed above. Possibly they come close to designating the really basic factors, but are each colored somewhat by the point of view and environment of the research.

As Prof. Hollingworth says, it is difficult to say how far all such systems of intercorrelations of judged traits "measure definite relations between different and specific traits, how far they measure the degree to which one's impressions of various traits conspire to make up one's notion of other characteristics, or how far they measure only the degree of confusion that exists as to the precise meaning of the various words." (30, p. 171.) To this may be answered, of course, that such is all we expect: that a trait is nothing more nor less than its estimates say it to be—that they in fact are its definition. But this answer only transfers our ignorance from the reliability of judgments back to the nature of the traits themselves, and makes them subjective impressions rather than objectively definable behavior characteristics. In short, intercorrelations of judged traits alone can never solve the problems of character. The hope lies in correlating these traits with data from other sources, and especially with anatomical and physiological characteristics. This study has aimed to suggest how this might be done.

This suggestion comes from my own study and from many others in this field; in regard to the traits or variables that should be used in measuring human nature. The most fundamental and significant variables will probable be neither the conventional list of adjectives, nor yet a list of the relative strengths of the several instincts, which Moore and I have been in a way trying to measure. They will rather be variables of the two following kinds: (a) Certain innate, "temperamental" variables that underlie and influence all instincts, and which are related to anatomical and physiological differences and may in time have correlations therewith demonstrated, such as bodily energy, general sthenic emotionality, tendency to be phlegmatic. In this category might, however, be admitted such variables as "strength of self-preservative tendencies in general" or "sex," etc. (b) Certain *acquired general factors*—general because they are reactions to stimuli which are *common elements* to a great many situations in life—cultural variables, such as for example, "morality," in large

part; "mechanical interests," etc. These variables refer to *stimuli* rather than the responses—are in McDougall's class of "sentiments." Many of them, however, may be related in some obscure way to innate differences of class (a).

It would seem that in the variable "objve" we have something of interest. There arises a strong temptation to try to identify this or relate it in some way to that striking character distinction which seems to appear in James' "tough-" and "tender-minded" types (32), Ostwald's romantic and classic types (46), Jung's extraversion and introversion (77), and in other literature (referred to in 77).

But supreme caution must here be observed. "Objve" seems to represent a tendency to matter-of-fact interests as opposed to love of introspection. If we could find a correlation between this love of introspection and Jung's introversion, or dementia praecox or paranoiac tendencies, we should be on the road to something very significant. But until we can demonstrate such a correlation, we have no right to say "objve" is anything fundamental. It may be a very superficial variable which appears here simply because it is the thing which these advertisement tests are best adapted to test.

In fact it is not at all clear that the distinctions made by Jung, James, Ostwald, and others, are the same thing, in spite of their remarkable similarity though coming from independent sources. If they are identical, however, we still must investigate the possibility that the distinction so celebrated is essentially a distinction in the world of *stimuli* or objects rather than in the nervous system or temperament. This offers a most important field for research.

APPENDIX

Table 3 shows the average rank values assigned to the several advertisements by the group as a whole. These results are interesting from the standpoint of advertising, and are directly comparable with those of Dr. Hollingworth (29). Our main discussion has neglected this aspect, as we have been chiefly interested in the intercorrelations, rather than the actual values of the different appeals.

Advs. (11+12), (35+36), and (47+48) form a very definite intra-correlating group, their correlations with each other being $+.71$, $+.35$ and $+.44$ by the unlike signs method and table. What is the similarity, the common element, between "nobby"—"stylish"—"tempting"—"appetizing"—"weird"—"intensely interesting?" Certainly they appeal to interests derived from very different instincts, but their correlations

TABLE 3
ADVERTISEMENTS AVERAGES FOR THE GROUP

Odd Series					Even Series					Pairs				
No. of advertisement	Adv. Appeal	Average rank value	Rank of ave. value (in odd series)	No. of times disliked	Rank of ave. value in series of the whole 48	No. of advertisement	Adv. Appeal	Average rank value	Rank of ave. value (in even series)	No. of times disliked	Rank of ave value in series of the whole 48	Ave. value of pairs (No. 1-2, 3-4, etc.)	Rank of values in preceding column	Approx. reliability correlation of each pair
1	Leadership.....	9.50	2	11	3	2	Ambition.....	10.27	6	10	10	19.77	2	+.80
2	Power.....	10.04	4	16	6	4	Mastery.....	9.04	1	9	2	19.08	1	+.80
3	Dignity.....	14.02	18	10	37	6	Distinction.....	13.45	18	11	35	27.47	18	+.64
4	Self reliance.....	10.75	7	8	14	8	Independence.....	10.25	5	10	9	21.00	4	+.44
5	Popular.....	15.49	22	14	43	10	Approved by thousands	14.74	20	14	39	30.23	22	+.16
6	Stylish.....	17.61	24	21	47	12	Nobly.....	18.61	24	31	48	36.22	24	+.58
7	Civic pride.....	10.98	8	17	16	14	Patriotism.....	11.03	9	15	17	22.01	7	+.43
8	Up-to-date.....	13.38	17	17	34	16	Progress.....	12.07	13	15	25	25.45	15	+.31
9	Conservative.....	17.03	23	20	45	18	Normality.....	17.10	23	16	46	34.13	23	+.14
10	Rare value.....	14.55	19	38	20	20	Quality.....	13.08	16	6	31	27.63	19	+.27
11	Durability.....	11.89	12	7	24	22	Stands the strain.....	12.83	14	9	28	24.72	14	+.08
12	Expeditions.....	10.34	5	11	22	24	Time saved.....	10.68	7	4	13	21.02	5	+.12
13	Efficiency.....	8.62	1	8	1	26	Gets results.....	11.81	12	6	23	20.43	3	+.55
14	Standard.....	11.30	9	7	19	28	Scientific.....	10.02	2	6	5	21.32	6	+.17
15	Ingenuity.....	10.65	6	6	12	30	Inventive genius.....	13.01	15	7	30	23.66	12	+.25
16	Mechanical ability.....	11.36	11	7	21	32	Control.....	11.58	11	3	22	22.94	10	+.37
17	Hygienic.....	15.30	21	14	42	33	Health.....	13.81	19	10	36	29.11	20	+.33
18	Tempting.....	11.34	10	6	20	36	Appetizing.....	11.13	10	6	18	22.47	8	+.48
19	Purity.....	12.50	14	6	27	38	Cleanliness.....	10.20	4	4	8	22.70	9	+.45
20	Economical.....	9.93	3	4	4	40	Bargain.....	16.24	22	16	44	26.17	17	+.15
21	Self reliance.....	12.28	13	6	26	42	Safety.....	13.34	17	10	33	25.62	16	+.21
22	Sympathy.....	12.91	15	8	29	44	Philanthropy.....	10.10	3	4	7	23.01	11	+.56
23	Affection.....	13.14	16	7	32	46	Friendship.....	10.87	8	6	13	24.01	13	+.52
24	Weird.....	14.85	20	10	41	48	Intensely interesting.....	14.80	21	10	40	29.65	21	+.47

are among the highest. They all suggest a certain element of "spiciness," naivete, "juiciness." But this itself requires explanation. Objectively speaking, they all seem to contain a certain stimulus element which culture has analyzed out of many diverse kinds of situations: they represent a cultural—a conventional—assembling of stimuli. It is just this that we need to beware of in all our interpretations of this kind of data. Many correlations may be due to purely cultural associations of things.

ADDITIONAL QUESTIONS IN QUESTIONNAIRE

11. What traits of personality and conduct, (physical, mental or moral) do you really like the most? (Not what you think you ought to like). Mention at least three under both (a) and (b), in *order of importance*.

(a) in other men (b) in women

12. Similarly, what traits do you most dislike?

(a) in other men (b) in women

13. What circumstances and situations in life provoke in you the most anger or irritation. Be as specific as you can without going into personal affairs.

14. If you were to take a trip across the United States, seeing everything you wish, mention *in order* of their appeal to you the chief kinds of things that would interest you. Not only material objects, but circumstances, facts, activities, etc., may be included.

15. Give complete list of your college activities, offices held, etc. Be sure to mention activities you have tried out for each year and all offices run for, though not secured. All this counts on your activity score. SENIORS may omit what they have already given in their [year-book] write-up. Use extra paper if necessary.

Question 13 was framed with the main purpose of getting a list of anger-stimuli from the free offerings of the subjects. Adequate study of character demands not only information as to the degree of a behavior tendency in toto, but also as to its stimuli. The answers were classified as follows: The number of mentions is given for each kind of stimulus and each group:

I. Behavior of other persons.

- | | |
|--|----|
| 1. Actual attack or injury, cruelty, ill treatment, oppression of the weak..... | 12 |
| 2. Self-assertive behavior | 39 |
| Insults to woman or elders 6; egotism, arrogance, conceit, superior air, officiousness, domineering 14; force or abuse toward self 1; bullying, teasing, plaguing, etc. 8; inquisitiveness, familiarity 3; ridicule, smart Aleckism 6; monopoly of conversation 1. | |
| 3. Unjust behavior | 20 |
| Unjust accusation or criticism, false motives attributed, failure to recognize good qualities of subject 11; to be imposed upon, discriminated against, or treated unfairly 9. | |

4. Unreasonable behavior	13
To argue with person who cannot be convinced, dogmatism, unreasonableness, opposition to recognized good purpose 6; misunderstanding 4; unreasonable moralizing or person who assumes to know more than he does 2; defense of double standard of morality 1.	
5. Deceitful behavior	21
False claims or hypocrisy 1; deceit in friendship 8; lying, cheating, dishonesty, promise-breaking 8; superficiality, shallowness, insincerity 3; disloyalty 1.	
6. Unkind, selfish behavior.....	7
Thoughtlessness, selfishness 3; lack of gratitude 3; personal slights from friend 1.	
7. Behavior particularly blocking desires of subject.....	7
"Interferes with my will" 2; having to do something merely to please others 1; someone gets what I want 1; lack of confidence in me 1; someone put something over on me 1; an arbitrary decision from which there is no appeal 1.	
8. Inefficiencies in the behavior of others.....	18
Inattention 3; weakness of will or decision 3; blind imitation of others 1; irresponsibility, neglect of duty, failure to keep word or engagement 5; laziness 1; foolish mistakes 2; childish actions, foolishness 2.	
9. Other behavior	29
Swearing and indecency 2; immorality 4; prudishness 1; ill-mannered acts 2; stubbornness 2; disobedience to orders or opposition of "those under me" 2; attack upon God, religion, or cherished ideals 2; the rest 1 each; extravagance, noisy actions in public, drunkenness, lack of self-respect, flirting, gossip, injuring self, refusal to support activities when financially able to do so; tendency to criticize, one whose whole aim is wealth, "sponging" on others for lessons, bad table manners, free borrowing without permission of my property, many people asking questions at once.	
II. Public events and behavior.....	3
Racial massacres, false promises of politicians, false opinion given by newspapers, 1 each.	
III. Behavior of one's self.....	3
Mistakes made by self 3.	
IV. Impersonal stimuli	15
Disappointment or failure 5; being bothered when concentrating, or interrupted 5; waiting 1; loss of article 1; disturbed from sleep 1; or quiet mood 1; forced by circumstances to act against will 1; having to do several things at once 1.	

The only variable made up out of these data was the tendency to include in this list of anger stimuli, stimuli of the group II—various forms of aggressive and domineering behavior of other persons.

The men were graded in 4 classes in this respect, according to the degree to which this class of stimuli predominated in

the answers. This variable was then related to aggressiveness, with the following results:

Class in respect to predominance of these stimuli	No. of men	Av. aggr.	No. of men	Av. aggr.	P.E.
++.....	17	+0.59			
+.....	16	+0.44	33	+0.51	.33
-.....	18	-0.89			
--.....	14	0	32	-0.50	.33
Unanswered.....	11	-2.00			

Standard deviation of all aggressiveness = 2.80.

Diff. = 1.01 = 3 times probable error.

That is, the more aggressive men seem more to resent aggressive behavior of others. This difference is hardly great enough to be significant, but is suggestive for further study. The answers also were classified as to whether they mentioned chiefly the sorrows and annoyances of the subject himself, or were stated more impersonally. This classification bore no relation to aggressiveness.

The answers to the other questions have not yet been analyzed but will be at a future date.

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